Instructor:	Selim Sukhtaiev	**Time:**	MWF 1:00-1:50
Office:	432 Herman Brown	**Classroom:**	HBH 423
Email:	ss168@rice.edu	**Office Hours:**	Friday 2-3 or by appointment

We know from the standard courses on ordinary differential equations and linear algebra that the first order system

$$u'(t) = Au(t), u(0) = \varphi,$$

can be solved via matrix exponential which is defined, for example, by a convergent series, and the solution is given by $u(t) = e^{tA}\varphi$. This gives rise to a one-parameter (semi)group $\{e^{tA}\}_{t\in R}$.

Several partial differential equations of interest (e.g., heat equation, wave equation, Schrödinger equation) fit within a similar framework if A is replaced by an infinite dimensional version of a matrix (called operator). However, since the operators in question are typically not bounded and not self-adjoint, the series for the exponential will not converge and a rigorous definition of e^{tA} and a notion of the solution should be carefully developed. This is achieved via the theory of C_0 semigroups which will be the main focus of this class.

Lecture notes: Lectures will be posed on Canvas. They are also available from

https://isem.math.kit.edu/index.php5/Phase_1:_The_lectures

(If the list of lectures does not appear, click on " Phase 1: The Lectures" on the left panel of the wiki page)

Additional course material: https://isem.math.kit.edu/index.php5/16th_Internet_Seminar

(Click on " Main page" on the left panel)

Homework: Written homework will be posted on Canvas.

Grades: Based on homework and participation.

Expectations: I expect you to attend every class and to arrive on time. It is your responsibility to keep informed of any announcements, syllabus adjustments, or policy changes made during scheduled classes. Not all announcements will be posted on the website.

Disability Support: Any student with a documented disability seeking academic adjustments or accommodations is requested to speak with me during the first two weeks of class. All such discussions will remain as confidential as possible. Students with disabilities will need to also contact Disability Support Services in the Allen Center